

EXEMPLAR SOLUTIONS PHYSICS

Class
11



Powered by



Chapter 5 - Work, Energy, and Power

Multiple Choice Questions I

6.1. An electron and a proton are moving under the influence of mutual forces. In calculating the change in the kinetic energy of the system during motion, one ignores the magnetic force of one on another. This is because,

- a) the two magnetic forces are equal and opposite, so they produce no net effect
- b) the magnetic forces do no work on each particle
- c) the magnetic forces do equal and opposite work on each particle
- d) the magnetic forces are necessarily negligible

Answer: b) the magnetic forces do no work on each particle

6.2. A proton is kept at rest. A positively charged particle is released from rest at a distance d in its field. Consider two experiments; one in which the charged particles is also a proton and in another, a positron. In the same time t , the work done on the two moving charged particles is

- a) same as the same force law is involved in the two experiments
- b) less for the case of a positron, as the positron moves away more rapidly and the force on it weakens
- c) more for the case of a positron, as the positron moves away a larger distance
- d) same as the work done by charged particle on the stationary proton

Answer: c) more for the case of a positron, as the positron moves away a larger distance

6.3. A man squatting on the ground gets straight up and stand. The force of reaction of ground on the man during the process is

- a) constant and equal to mg in magnitude
- b) constant and greater than mg in magnitude
- c) variable but always greater than mg
- d) at first greater than mg , and later becomes equal to mg

Answer: d) at first greater than mg , and later becomes equal to mg

6.4. A bicyclist comes to a skidding stop in 10 m. During this process, the force on the bicyclist due to the road is 200 N and is directly opposed to the motion. The work done by the cycle on the road is

- a) +2000 J
- b) -200 J
- c) zero
- d) -20,000 J

Answer: c)

zero

6.5. A body is falling freely under the action of gravity alone in vacuum. Which of the following quantities remain constant during the fall?

- a) kinetic energy
- b) potential energy
- c) total mechanical energy
- d) total linear momentum

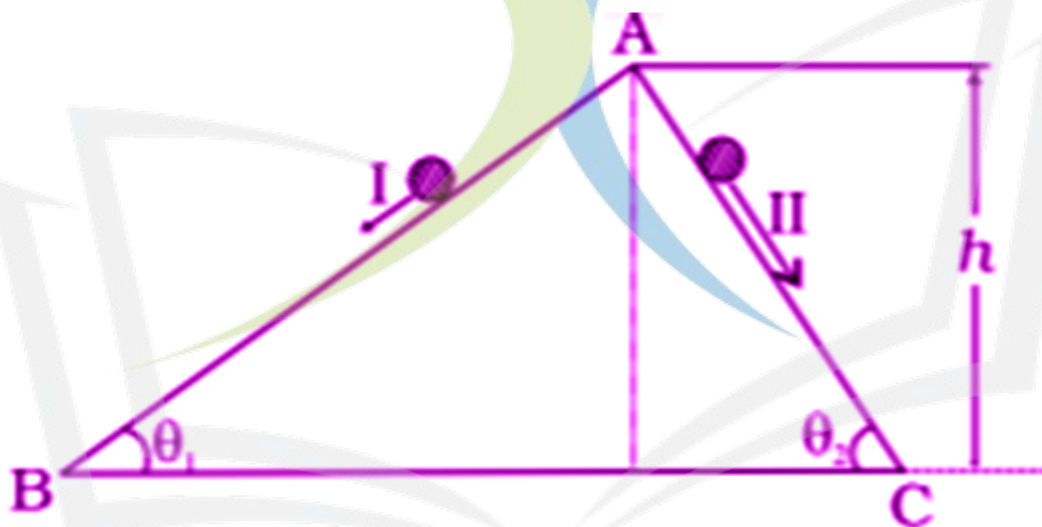
Answer: c)
total mechanical energy

6.6. During inelastic collision between two bodies, which of the following quantities always remain conserved?

- a) total kinetic energy
- b) total mechanical energy
- c) total linear momentum
- d) speed of each body

Answer: c) total linear momentum

6.7. Two inclined frictionless tracks, one gradual and the other steep meet at A from where two stones are allowed to slide down from rest, one on each track as shown in the figure. Which of the following statement is correct?

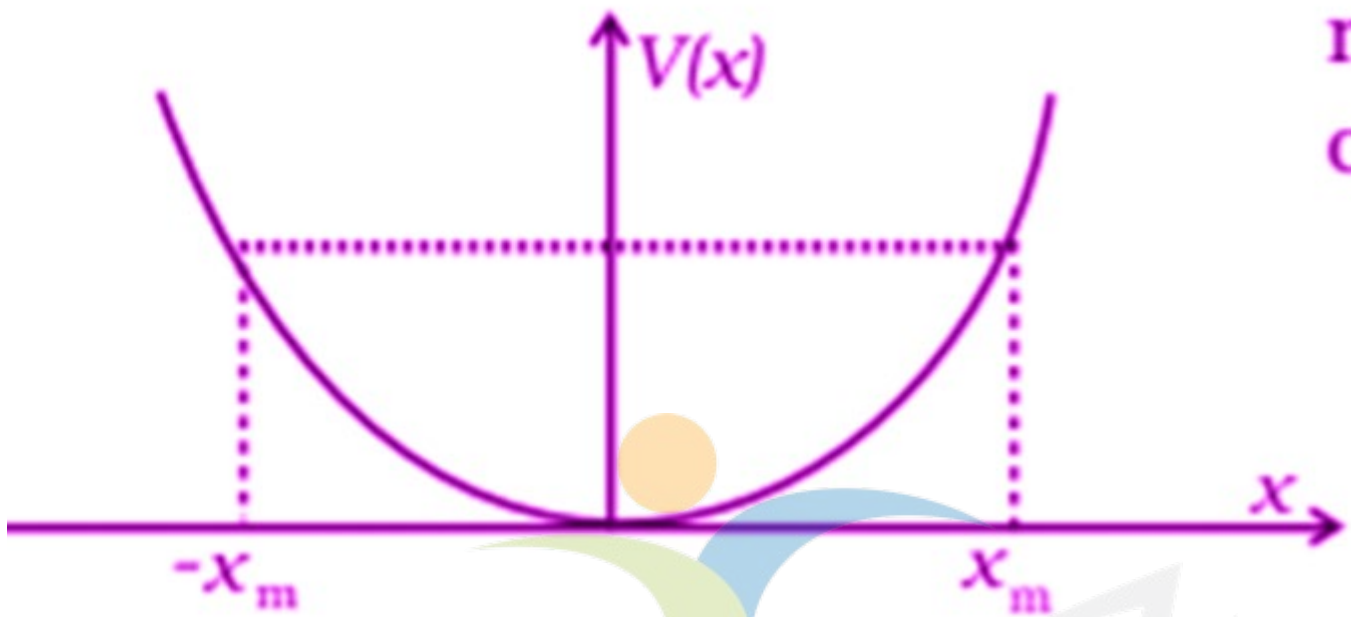


- a) both the stones reach the bottom at the same time but not with the same speed
- b) both stone reach the bottom with the same speed and stone I reaches the bottom earlier than stone II
- c) both the stones reach the bottom with the same speed and stone II reaches the bottom earlier than stone I
- d) both the stones reach the bottom at different times and with different speeds

Answer: c) both the stones reach the bottom with the same speed and stone II reaches the bottom earlier than stone I

6.8. The potential energy function for a particle executing linear SHM is given by $V(x) = \frac{1}{2}kx^2$

where k is the force constant of the oscillator. For $k = 0.5 \text{ N/m}$, the graph of $V(x)$ versus x is shown in the figure. A particle of total energy E turns back when it reaches $x = \pm x_m$, then which of the following is correct?



a) $V = 0, K = E$

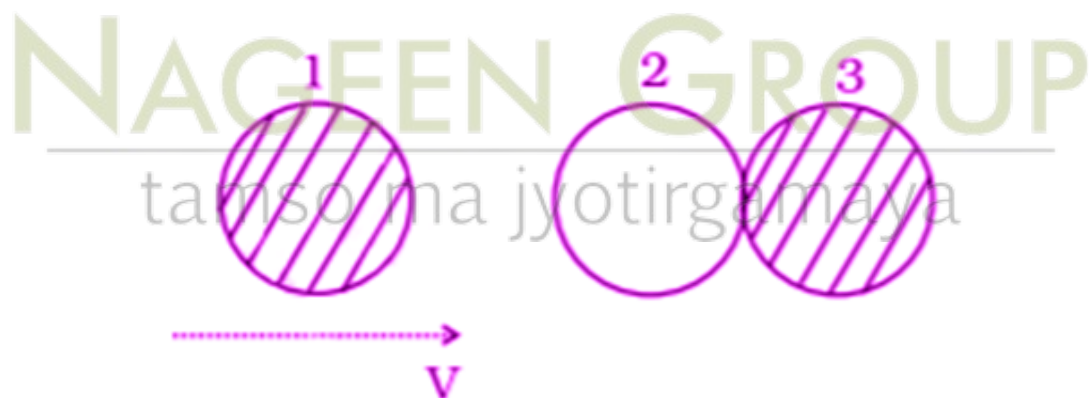
b) $V = E, K = 0$

c) $V < E, K = 0$

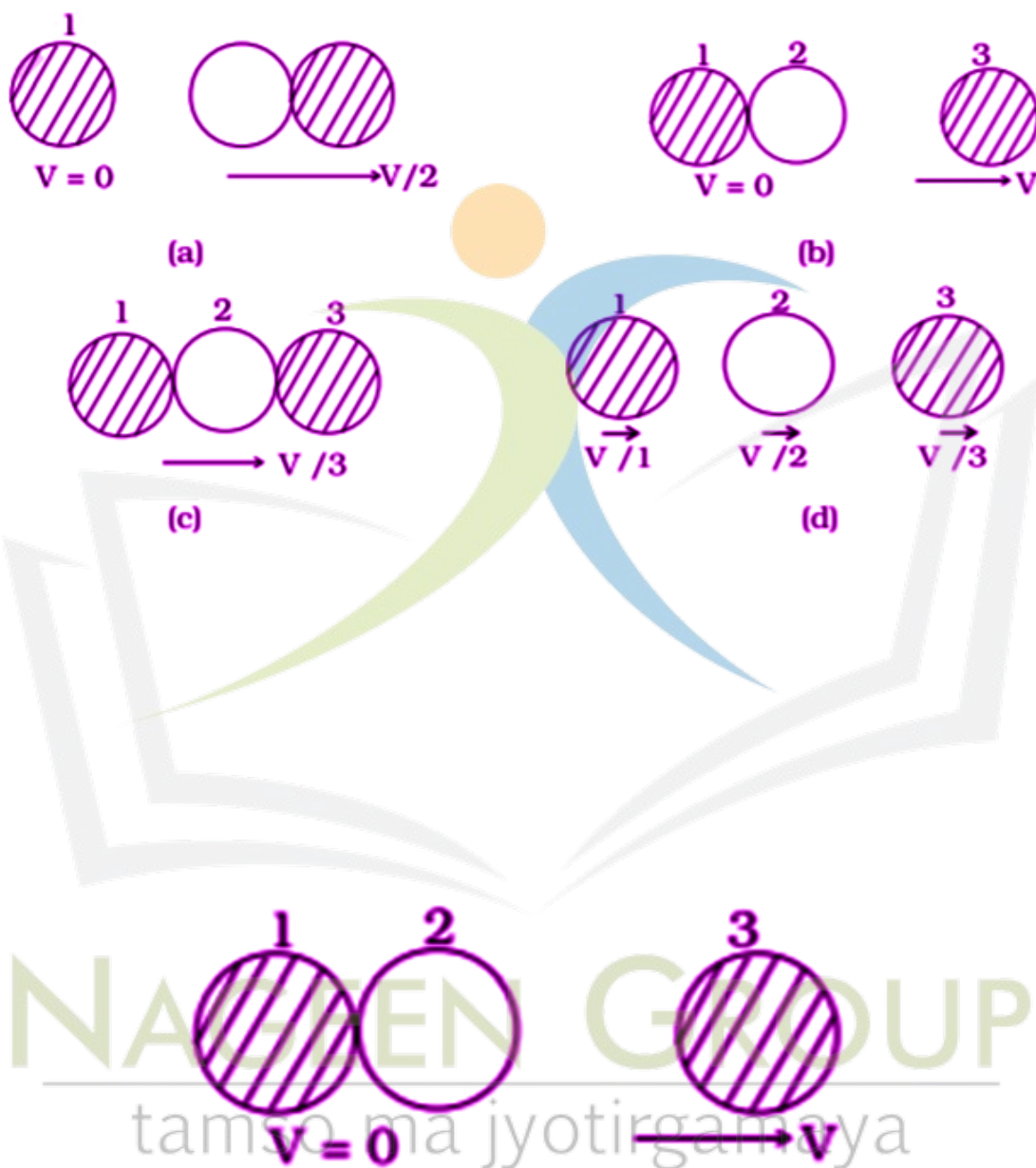
d) $V = 0, K < E$

Answer: b) $V = E, K = 0$

6.9. Two identical ball bearings in contact with each other and resting on a frictionless table are hit head-on by another ball bearing of the same mass moving initially with a speed V as shown:



If the collision is elastic, which of the following is a possible result after collision?



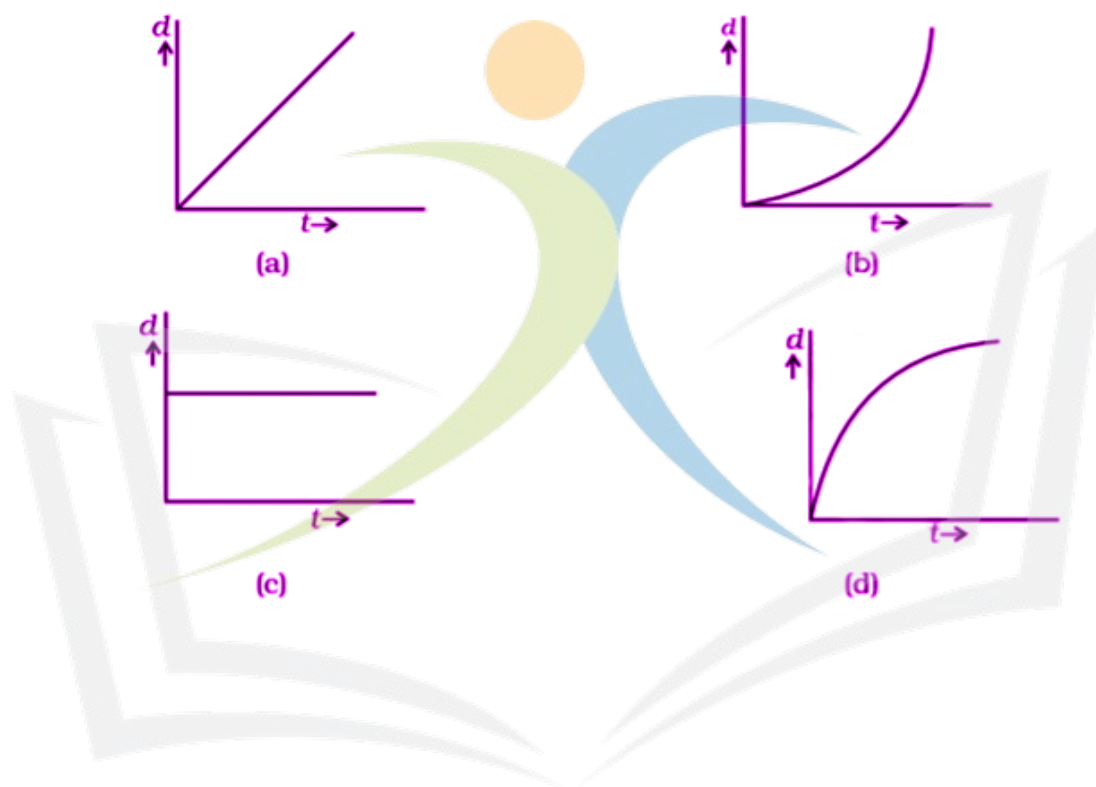
Answer:
b)

6.10. A body of mass 0.5 kg travels in a straight line with velocity $v = ax^{3/2}$ where $a = 5 \text{ m}^{-1/2}\text{s}^{-1}$. The work done by the net force during its displacement from $x = 0$ to $x = 2 \text{ m}$ is
a) 1.5 J

- b) 50 J
- c) 10 J
- d) 100 J

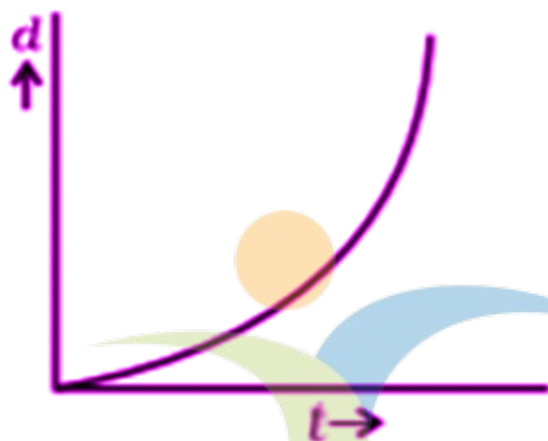
Answer: b) 50 J

6.11. A body is moving unidirectionally under the influence of a source of constant power supplying energy. Which of the diagrams shown in the figure correctly shows the displacement-time curve for its motion?

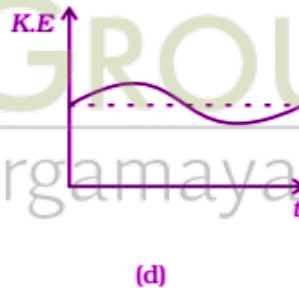
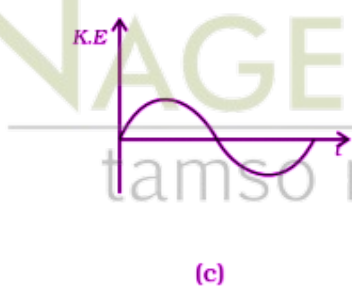
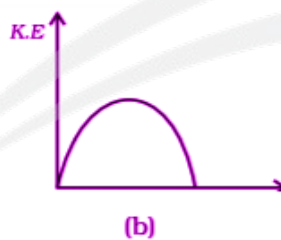
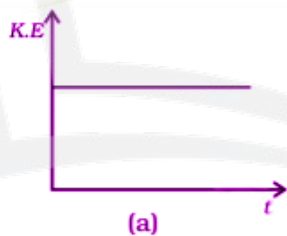


Answer:
b)

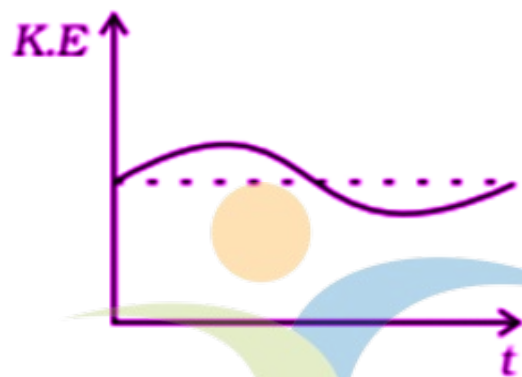
NAGEEN GROUP
tamso ma jyotirgamaya



6.12. Which of the diagrams shown in figure most closely shows the variation in kinetic energy of the earth as it moves once around the sun in its elliptical orbit?



Answer:
d)



6.13. Which of the diagrams shown in figure represents variations of total mechanical energy of a pendulum oscillating in air as function of time?



Answer:

c)



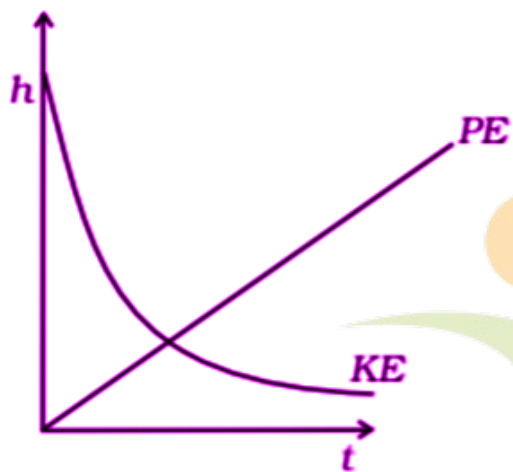
6.14. A mass of 5 kg is moving along a circular path of radius 1 m. If the mass moves with 300 revolutions per minute, its kinetic energy would be

- a) $250\pi^2$
- b) $100\pi^2$
- c) $5\pi^2$
- d) 0

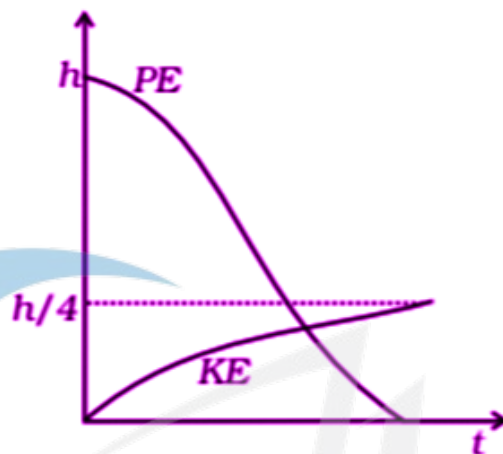
Answer: a) $250\pi^2$

6.15. A raindrop falling from a height h above ground, attains a near terminal velocity when it has fallen through a height $(3/4)h$. Which of the diagrams show correctly the change in kinetic and potential energy of the drop during its falls up to the ground?

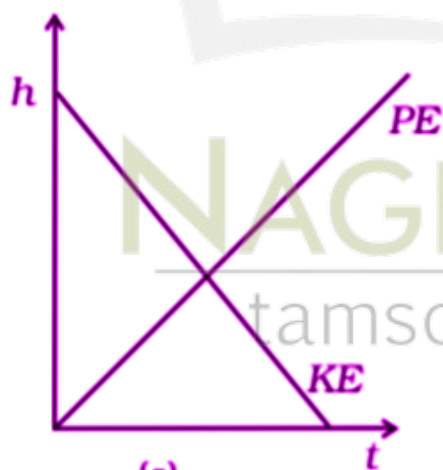
tamso ma jyotirgamaya



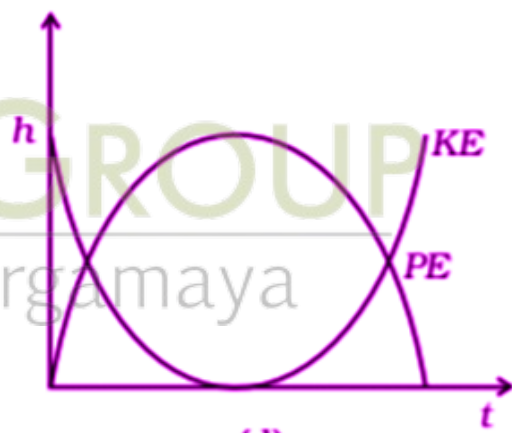
(a)



(b)



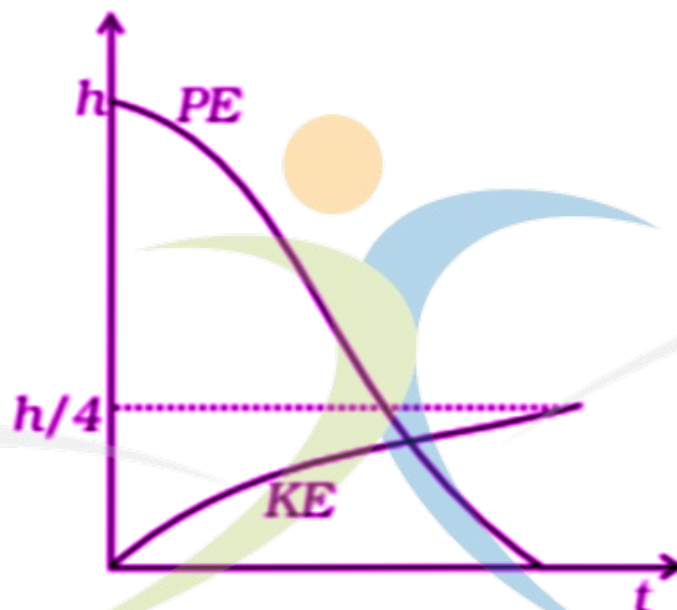
(c)



(d)

Answer:

b)



6.16. In a shotput event an athlete throws the shotput of mass 10 kg with an initial speed of 1 m/s at 45° from height 1.5 m above ground. Assuming air resistance to be negligible and acceleration due to gravity to be 10 m/s^2 , the kinetic energy of the shotput when it just reaches the ground will be

a) 2.5 J

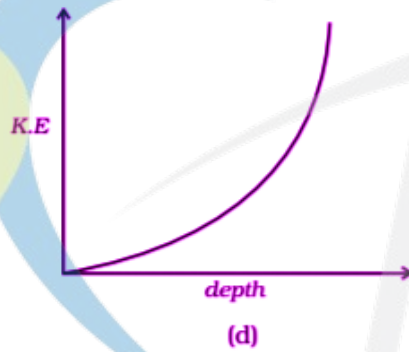
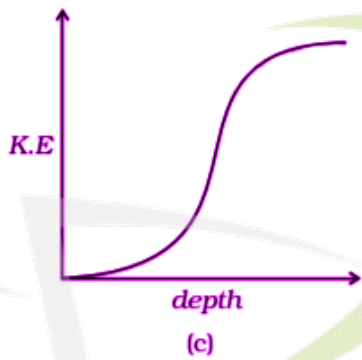
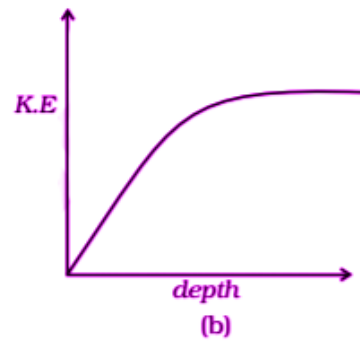
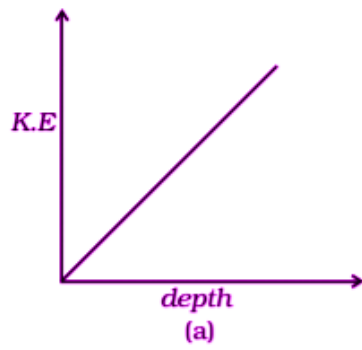
b) 5.0 J

c) 52.5 J

d) 155.0 J

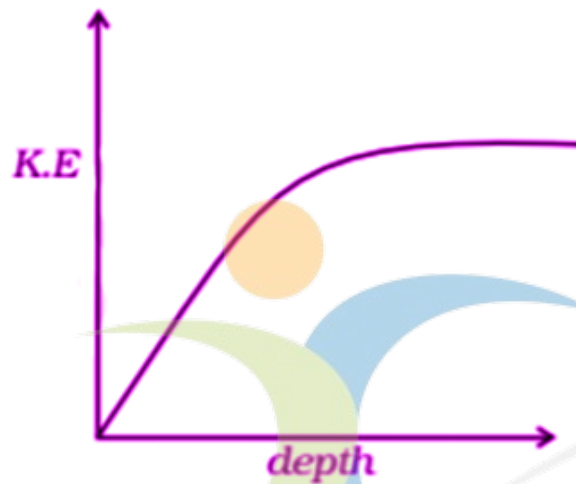
Answer: d) 155.0 J

6.17. Which of the diagrams in figure correctly shows the change in kinetic energy of an iron sphere falling freely in a lake having sufficient depth to impart it a terminal velocity?



Answer:
b)

NAGEEN GROUP
tamso ma jyotirgamaya



6.18. A cricket ball of mass 150 g moving with a speed of 126 km/h hits at the middle of the bat, held firmly at its position by the batsman. The ball moves straight back to the bowler after hitting the bat. Assuming that collision between ball and bat is completely elastic and the two remain in contact for 0.001 sec, the force that the batsman had to apply to hold the bat firmly at its place would be

- a) 10.5 N
 - b) 21 N
 - c) 1.05×10^4 N
 - d) 2.1×10^4 N
- Answer: c) 1.05×10^4 N

Multiple Choice Questions II

6.19. A man, of mass m , standing at the bottom of the staircase, of height L climbs it and stands at its top.

- a) work done by all forces on man is zero
- b) work done by all the force on man is zero
- c) work done by the gravitational force on man is mgL
- d) the reaction force from a step does not do work because the point of application of the force does not move while the force exists

Answer:

- b) work done by all the force on man is zero
- d) the reaction force from a step does not do work because the point of application of the force does not move while the force exists

6.20. A bullet of mass m fired at 30° to the horizontal leaves the barrel of the gun with a velocity v . The bullet hits a soft target at a height h above the ground while it is moving downward and emerges out with

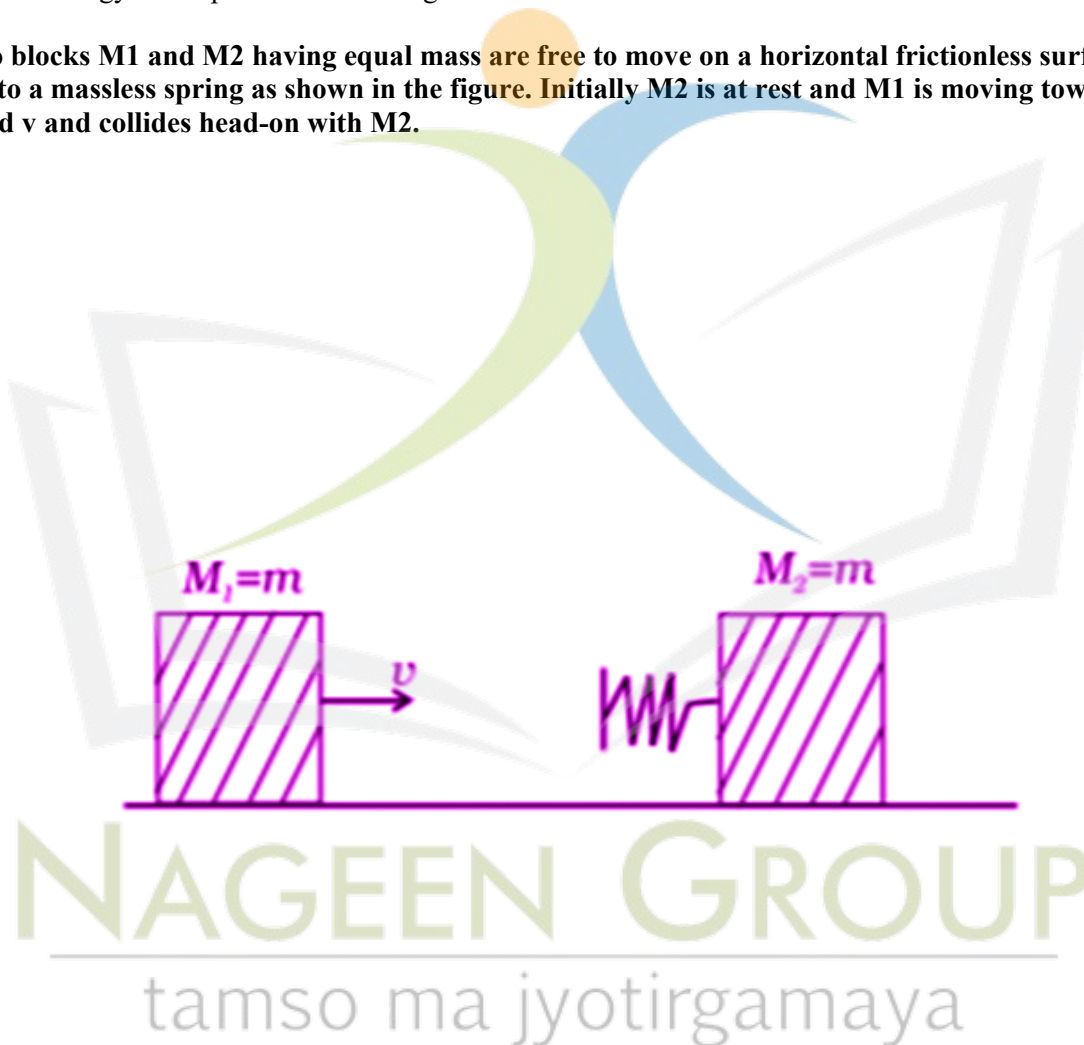
half the kinetic energy it had before hitting the target. Which of the following statements are correct in respect of bullet after it emerges out of the target?

- a) the velocity of the bullet will be reduced to half its initial value
- b) the velocity of the bullet will be more than half of its earlier velocity
- c) the bullet will continue to move along the same parabolic path
- d) the bullet will move in a different parabolic path
- e) the bullet will fall vertically downward after hitting the target
- f) the internal energy of the particles of the target will increase

Answer:

- b) the velocity of the bullet will be more than half of its earlier velocity
- d) the bullet will move in a different parabolic path
- f) the internal energy of the particles of the target will increase

6.21. Two blocks M_1 and M_2 having equal mass are free to move on a horizontal frictionless surface. M_2 is attached to a massless spring as shown in the figure. Initially M_2 is at rest and M_1 is moving toward M_2 with speed v and collides head-on with M_2 .



- a) while spring is fully compressed all the KE of M_1 is stored as PE of spring
- b) while spring is fully compressed the system momentum is not conserved, though final momentum is equal to initial momentum
- c) if spring is massless, the final state of the M_1 is state of rest
- d) if the surface on which blocks are moving has friction, then collision cannot be elastic

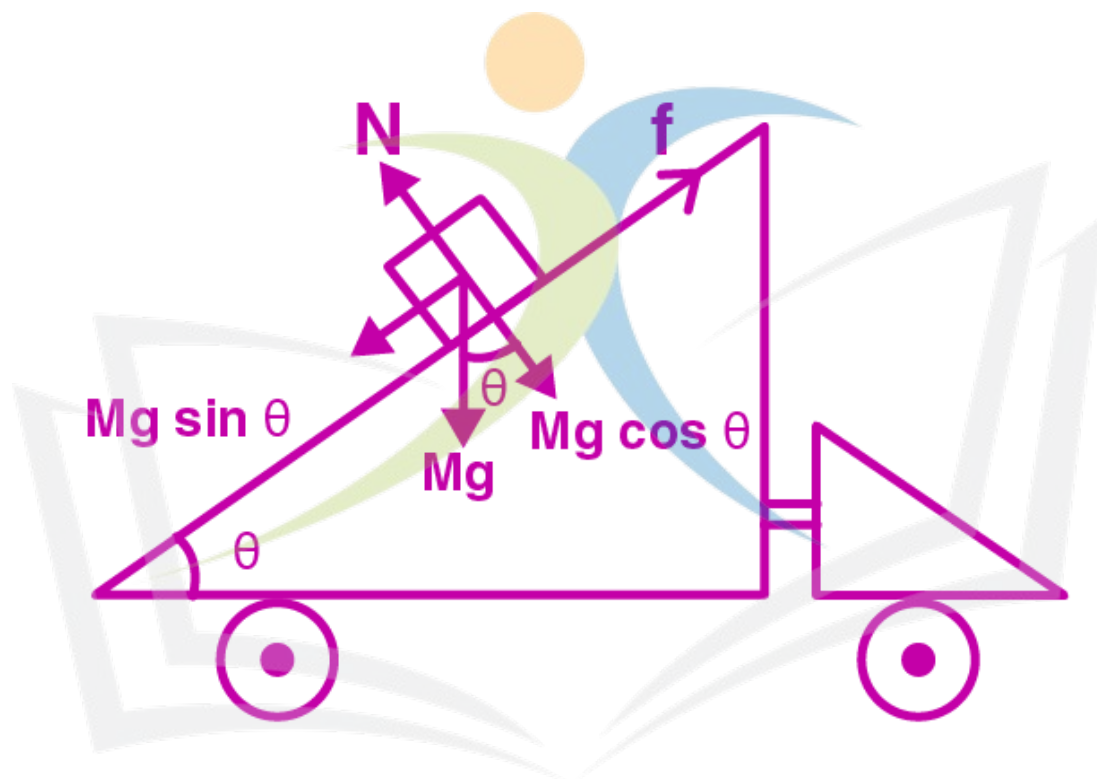
Answer:

- c) if spring is massless, the final state of the M_1 is state of rest
- d) if the surface on which blocks are moving has friction, then collision cannot be elastic

Very Short Answer

6.22. A rough inclined plane is placed on a cart moving with a constant velocity u on horizontal ground. A block of mass M rests on the incline. Is any work done by force of friction between the block and incline? Is there then a dissipation of energy?

Answer:



From the above figure it is clear that the block is inclined on the plane. There is no work done, as there is no displacement happening and no dissipation energy takes place.

6.23. Why is electrical power required at all when the elevator is descending? Why should there be a limit on the number of passengers in this case?

Answer:

There is limit on the number of passengers in case of an elevator descending as it is not a free fall and moves down with a uniform speed.

6.24. A body is being raised to a height h from the surface of earth. What is the sign of work done by

- a) applied force
- b) gravitational force

Answer:

- a) The work done by the applied force is positive
- b) The work done by the gravitational force is negative

6.25. Calculate the work done by a car against gravity in moving along a straight horizontal road. The mass of the car is 400 kg and the distance moved is 2m.

Answer:

$$WD = Fs \cos \theta$$

$$WD = Fs \cos 90^\circ = 0$$

Therefore, the work done by the car against the gravity is zero.

6.26. A body falls towards earth in air. Will its total mechanical energy be conserved during the fall?

Justify.

Answer:

The total mechanical energy of the free falling body is not conserved as this energy is used against the force of friction from the air molecules.

6.27. A body is moved along a closed loop. Is the work done in moving the body necessarily zero? If not, state the condition under which work done over a closed path is always zero.

Answer:

The work done by the moving body is zero when the conservative force is acting on the body during the motion.

The work done by the moving body is non-zero when the non-conservative force is acting on the body.

6.28. In an elastic collision of two billiard balls, which of the following quantities remain conserved during the short time of collision of the balls

a) kinetic energy

b) total linear momentum

Give reason for your answer in each case.

Answer:

The kinetic energy and the total linear momentum of the billiard balls are conserved as there is no non-conservative force.

6.29. Calculate the power of a crane in watts, which lifts a mass of 100 kg to a height of 10 m in 20 sec.

Answer:

$$P = WD/\text{time} = Fs \cos \theta/t = mgh \cos \theta/t$$

$$h = 10 \text{ m}$$

$$t = 20 \text{ sec}$$

$$F = mg = 1000$$

$$\text{Therefore, } P = 500 \text{ Watts}$$

6.30. The average work done by a human heart while it beats once is 0.5 J. Calculate the power used by heart if it beats 72 times in a minute.

Answer:

$$P = WD/\text{time}$$

$$WD \text{ in one beat of heart} = 0.5 \text{ J}$$

$$WD \text{ in 72 beats} = 36 \text{ J}$$

$$P = WD/t = 0.6 \text{ W}$$

6.31. Give example of a situation in which an applied force does not result in a change in kinetic energy.

Answer:

Work done during the circular motion there is no change in the kinetic energy.

6.32. Two bodies of unequal mass are moving in the same direction with equal kinetic energy. The two bodies are brought to rest by applying retarding force of same magnitude. How would the distance moved

by them before coming to rest compare?

Answer:

$$KE_1 = KE_2$$

$$WD_1 = WD_2$$

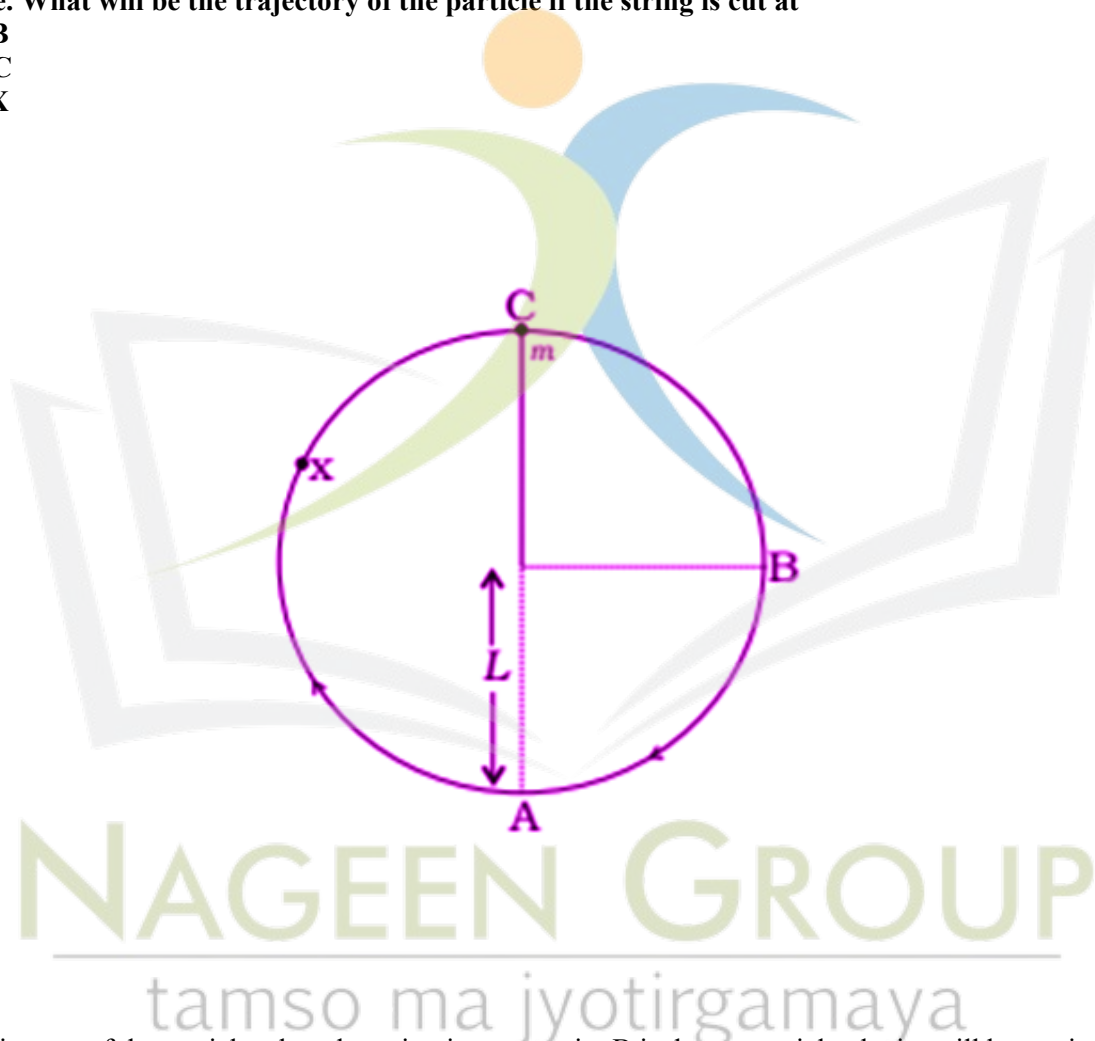
$$F_1 s_1 = F_2 s_2$$

$$F_1 = F_2$$

$$s_1 = s_2$$

6.33. A bob of mass m suspended by a light string of length L is whirled into a vertical circle as shown in the figure. What will be the trajectory of the particle if the string is cut at

- a) point B
- b) point C
- c) point X



Answer:

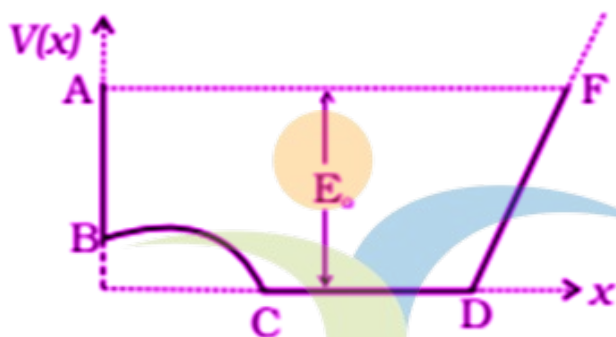
a) The trajectory of the particle when the string is cut at point B is the tangential velocity will be vertically downward and the bob will move along the same path.

b) The trajectory of the particle when the string is cut at point C is the tangential velocity will be horizontal and will move in half parabolic path.

c) The trajectory of the particle when the string is cut at point X is when angle θ is from and will move in the parabolic path till the bob reaches the highest point.

Short Answer

6.34. A graph of potential energy $V(x)$ versus x is shown in the figure. A particle of energy E_0 is executing motion in it. Draw graph of velocity and kinetic energy versus x for one complete cycle AFA.



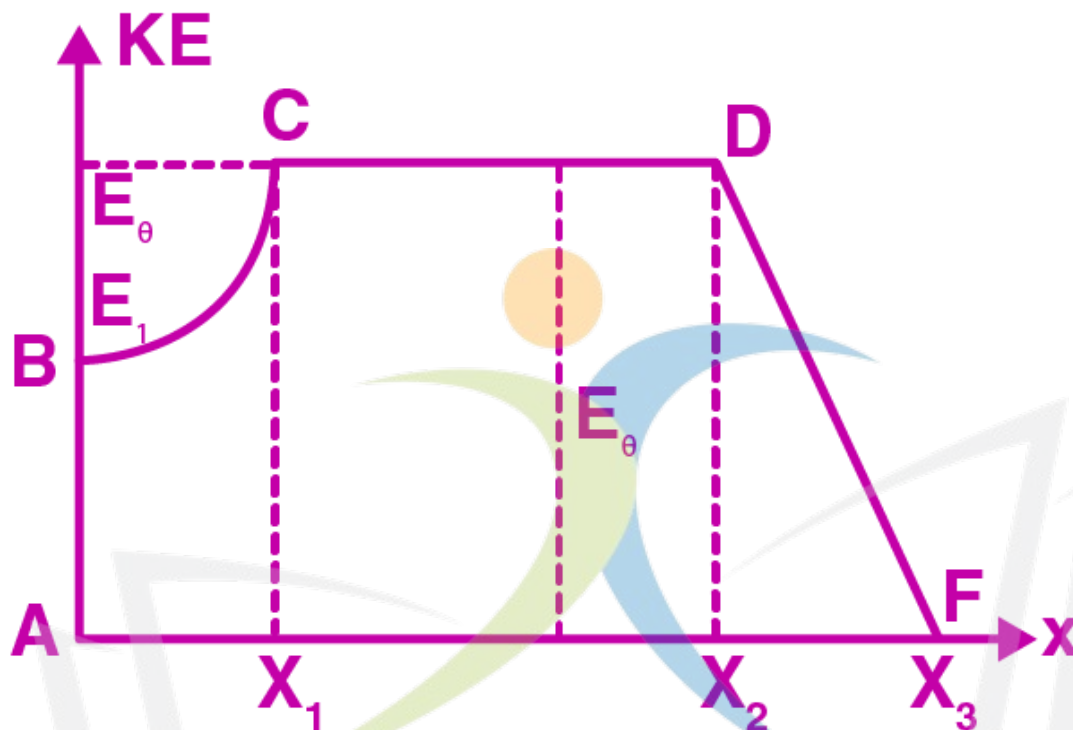
Answer:

From the given graph of KE versus x

x	KE	Point
0	0	A
0	E_1	B
X_1	E_0	C
X_2	E_0	D
X_3	0	F

From the below graph of velocity versus x

NAGEEN GROUP
tamso ma jyotirgamaya



Point	V	X
A	0	0
B	$\pm V_1$	0
C	$\pm V_0$	X_1
D	$\pm V_0$	X_2
E	0	X_3

6.35. A ball of mass m , moving with a speed $2v_0$ collides inelastically with an identical ball at rest. Show that

a) for head-on collision, both the balls move forward

b) for a general collision, the angle between the two velocities of scattered balls is less than 90° .

Answer:

a) Let v_1 and v_2 be the velocities of the two balls after the collision. According to the law of conservation of momentum,

$$mv_0 = mv_1 + mv_2$$

$$v_2 = v_1 + 2v_0$$

$$e < 1$$

b)



According to the law of conservation of momentum,

$$p = p_1 + p_2$$

When the angle between the p_1 and p_2 is 90° , $p > p_1 + p_2$

6.36. Consider a one-dimensional motion of a particle with total energy E . There are four regions A, B, C, and D in which the relation between potential energy V , kinetic energy (K) and total energy is as given below:

Region A: $V > E$

Region B: $V < E$

Region C: $K > E$

Region D: $V > K$

State with reason in each case whether a particle can be found in the given region or not.

Answer:

For region A, $E = V + K$ and $V > E$ which means that the KE is negative and this is not possible.

For region B, $K = E - V$ and $V < E$ which means that both the energies are greater than zero

For region C, $V = E - K$ and $K > E$ which means that PE is negative

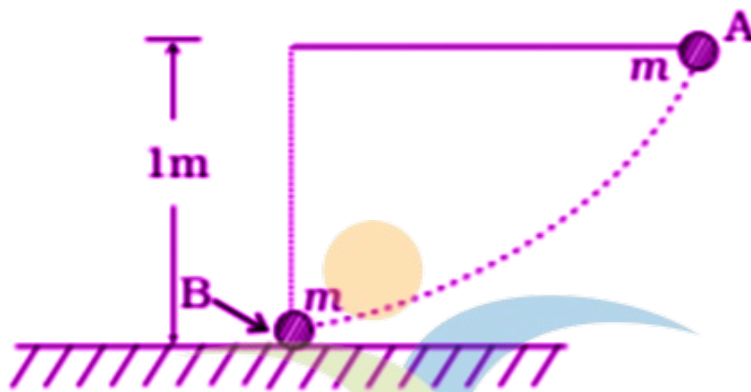
For region D, $K = E - V$ and $V > K$ which means that PE is greater than KE

6.37. The bob A of a pendulum released from horizontal to the vertical hits another bob B of the same mass at rest on a table as shown in the figure. If the length of the pendulum is 1 m, calculate

a) the height to which bob A will rise after collision

b) the speed with which bob B starts moving.

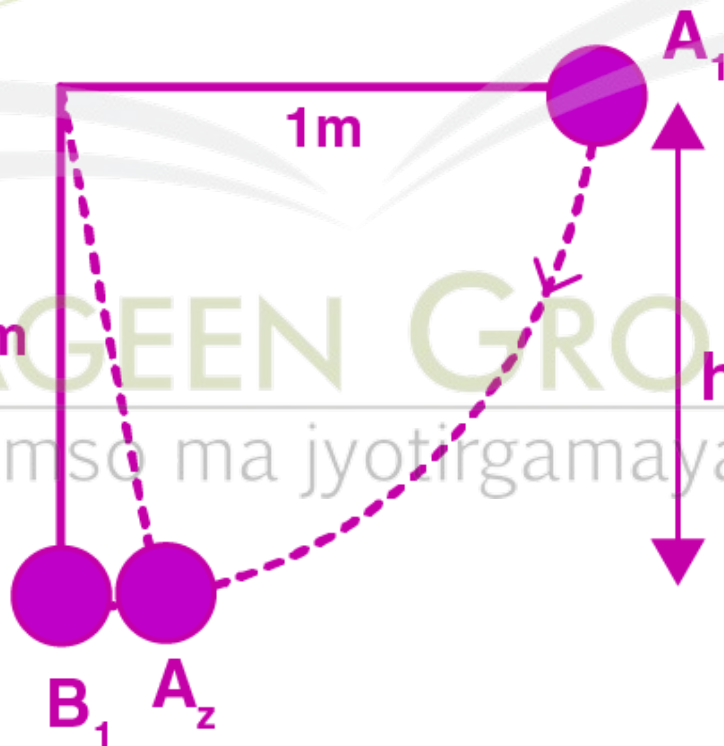
Neglect the size of the bobs and assume the collision to be elastic.



Answer:

a) There is no much rise in bob A after collision as the PE of the bob A gets converted in KE and the momentum is transferred to the bob B.

b)



The speed of bob B is found using the sum of KE of bob A and KE of bob B = 4.42 m/s

6.38. A raindrop of mass 1.00 g falling from a height of 1 km hits the ground with a speed of 50 m/s.

Calculate

- the loss of PE of the drop
- the gain in KE of the drop
- is the gain in KE equal to loss of PE? If not why?

Answer:

a) PE at the highest point = 10 J

b) Gain in KE = $\frac{1}{2} mv^2 = 1.250 \text{ J}$

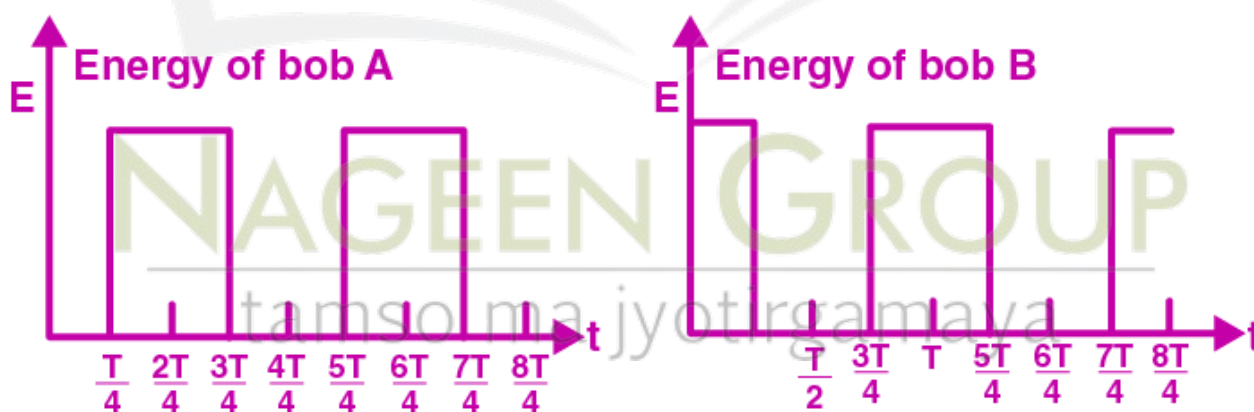
c) Gain in KE is not equal to the PE

6.39. Two pendulums with identical bobs and lengths are suspended from a common support such that in rest position the two bobs are in common. One of the bobs is released after being displaced by 10° so that it collides elastically head-on with the other bob.

- describe the motion of two bobs
- draw a graph showing variation in energy of either pendulum with time for $0 \leq t \leq 2T$ where T is the period of each pendulum

Answer:

Time t	KE _a	PE _a	E _a	KE _b	PE _b	E _b
0	0	0	0	0	E	E
T/4	E	0	E	0	0	0
2T/4	E	0	0	0	E	E
3T/4	E	0	E	0	0	0
4T/4 = T	0	0	0	0	E	E



6.40. Suppose the average mass of raindrops is $3.0 \times 10^{-5} \text{ kg}$ and their average terminal velocity 9 m/s. Calculate the energy transferred by rain to each square meter of the surface at a place which receives 100 cm of rain in a year.

Answer:

Energy transferred by the rain to the surface of the earth = $\frac{1}{2} mv^2$

The velocity of the rain = 9 m/s

Mass = (volume)(density) = 1000 kg

Energy transferred by 100 cm rainfall = $\frac{1}{2} mv^2 = 4.05 \times 10^4 \text{ J}$

6.41. A engine is attached to a wagon through a shock absorber of length 1.5 m. The system with a total mass of 50,000 kg is moving with a speed of 36 km/h when the brakes are applied to bring it to rest. In the process of the system being brought to rest, the spring of the shock absorber gets compressed by 1.0 m. If 90% of energy of the wagon is lost due to friction, calculate the spring constant.

Answer:

$KE = \frac{1}{2} mv^2$

$m = 50000 \text{ kg}$

$v = 10 \text{ m/s}$

$KE = 2500000 \text{ J}$

KE of spring = 10% of the KE wagon

$K = 5 \times 10^5 \text{ N/m}$

6.42. An adult weighing 600 N raises the centre of gravity of his body by 0.25 m while taking each step of 1 m length in jogging. If he jogs for 6 km, calculate the energy utilized by him in jogging assuming that there is no energy loss due to friction of ground and air. Assuming that the body of the adult is capable of converting 10% of energy intake in the form of food, calculate the energy equivalents of food that would be required to compensate energy utilized for jogging.

Answer:

The energy used up is given as = mgh

$mg = 600 \text{ N}$

$h = 0.25 \text{ m}$

No. of steps in 6 km = 6000 steps

Energy used in 6000 m = $(6000)(600)(0.25) \text{ J}$

Energy utilized in jogging = $9 \times 10^4 \text{ J}$

6.43. On complete combustion a litre of petrol gives off heat equivalent to $3 \times 10^7 \text{ J}$. In a test drive a car weighing 1200 kg, including the mass of driver, runs 15 km per litre while moving with a uniform speed on a surface and air to be uniform, calculate the force of friction acting on the car during the test drive, if the efficiency of the car engine were 0.5.

Answer:

Efficiency of the car engine = 0.5

Energy given by the car with 1 litre of petrol = 1.5×10^7

$WD = 1.5 \times 10^7$

$f = 10^3 \text{ N}$

Long Answers

6.44. A block of mass 1 kg is pushed up a surface inclined to horizontal at an angle of 30° by a force of 10 N parallel to the inclined surface. The coefficient of friction between block and the incline is 0.1. If the block is pushed up by 10 m along the incline, calculate

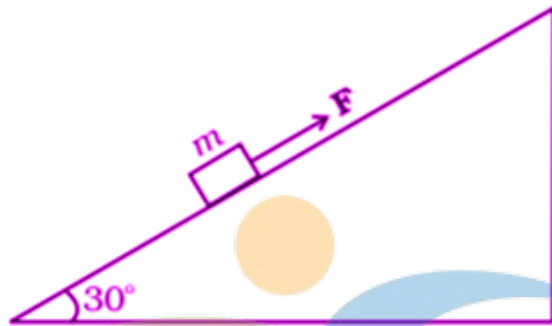
a) work done against gravity

b) work done against force of friction

c) increase in potential energy

d) increase in kinetic energy

e) work done by applied force



Answer:

a) Work done against gravity = mgh

$h = 5 \text{ m}$

WD against gravity = 50 J

b) Work done against force of friction is $\mu fs = 5\sqrt{3} \text{ J}$

c) Increase in PE = WD against the gravity = 50 J

d) Increase in KE is equal to the WD by the system = $\Delta K = WD = 41.340 \text{ J}$

e) WD by the applied force = $Fs = 100 \text{ J}$

6.45. A curved surface as shown in the figure. The portion BCD is free of friction. There are three spherical balls of identical radii and masses. Balls are released from one by one from A which is at a slightly greater height than C. with the surface AB, ball 1 has large enough friction to cause rolling down without slipping; ball 2 has a small friction and ball 3 has a negligible friction.

a) for which balls is total mechanical energy conserved?

b) which ball can reach D?

c) for balls which do not reach D, which of the balls can reach back A?

Answer:

a) For ball 1 the total mechanical energy is conserved

b) Ball 1 reaches D

c) Ball 3 reaches back A

6.46. A rocket accelerates straight up by ejecting gas downwards. In a small time interval Δt , it ejects a gas of mass Δm at a relative speed u . Calculate KE of the entire system at $t + \Delta t$ and t and show that the device that ejects gas does work = $(1/2) \Delta m u^2$ in this time interval.

Answer:

M is the mass of the rocket at any time t

v is the velocity of the rocket

Δm is the mass of the gas that is ejected during the time interval Δt
Therefore, $K = \frac{1}{2} u^2 \Delta m$

6.47. Two identical steel cubes collide head-on face to face with a speed of 10 cm/s each. Find the maximum compression of each. Young's modulus for steel = $Y = 2 \times 10^{11} \text{ N/m}^2$.

Answer:

$Y = \text{stress/strain}$

$Y = FL/A\Delta L$

$WD = F\Delta L$

$KE = 5 \times 10^{-4} \text{ J}$

$WD = KE$

$\Delta L = 5 \times 10^{-7} \text{ m}$

6.48. A balloon filled with helium rises against gravity increasing its potential energy. The speed of the balloon also increases as it rises. How do you reconcile this with the law of conservation of mechanical energy? You can neglect viscous drag of air and assume that density of air is constant.

Answer:

When the dragging viscous force of the air on the balloon is neglected, then the net buoyant force = $v\rho g$

Where v is the volume of air displaced

ρ is the net density upward

After calculation, it can be said that as the balloon goes up, the sum of kinetic energy and the potential energy of the balloon will be equal to change in potential energy in the air.

NAGEEN GROUP
tamso ma jyotirgamaya

CLICK TO DOWNLOAD NCERT EXEMPLAR SOLUTIONS

CLASS 11: PHYSICS (ALL CHAPTERS)





JOIN OUR WHATSAPP GROUPS

FOR FREE EDUCATIONAL
RESOURCES





JOIN SCHOOL OF EDUCATORS WHATSAPP GROUPS FOR FREE EDUCATIONAL RESOURCES

We are thrilled to introduce the School of Educators WhatsApp Group, a platform designed exclusively for educators to enhance your teaching & Learning experience and learning outcomes. Here are some of the key benefits you can expect from joining our group:

BENEFITS OF SOE WHATSAPP GROUPS

- **Abundance of Content:** Members gain access to an extensive repository of educational materials tailored to their class level. This includes various formats such as PDFs, Word files, PowerPoint presentations, lesson plans, worksheets, practical tips, viva questions, reference books, smart content, curriculum details, syllabus, marking schemes, exam patterns, and blueprints. This rich assortment of resources enhances teaching and learning experiences.
- **Immediate Doubt Resolution:** The group facilitates quick clarification of doubts. Members can seek assistance by sending messages, and experts promptly respond to queries. This real-time interaction fosters a supportive learning environment where educators and students can exchange knowledge and address concerns effectively.
- **Access to Previous Years' Question Papers and Topper Answers:** The group provides access to previous years' question papers (PYQ) and exemplary answer scripts of toppers. This resource is invaluable for exam preparation, allowing individuals to familiarize themselves with the exam format, gain insights into scoring techniques, and enhance their performance in assessments.

- **Free and Unlimited Resources:** Members enjoy the benefit of accessing an array of educational resources without any cost restrictions. Whether its study materials, teaching aids, or assessment tools, the group offers an abundance of resources tailored to individual needs. This accessibility ensures that educators and students have ample support in their academic endeavors without financial constraints.
- **Instant Access to Educational Content:** SOE WhatsApp groups are a platform where teachers can access a wide range of educational content instantly. This includes study materials, notes, sample papers, reference materials, and relevant links shared by group members and moderators.
- **Timely Updates and Reminders:** SOE WhatsApp groups serve as a source of timely updates and reminders about important dates, exam schedules, syllabus changes, and academic events. Teachers can stay informed and well-prepared for upcoming assessments and activities.
- **Interactive Learning Environment:** Teachers can engage in discussions, ask questions, and seek clarifications within the group, creating an interactive learning environment. This fosters collaboration, peer learning, and knowledge sharing among group members, enhancing understanding and retention of concepts.
- **Access to Expert Guidance:** SOE WhatsApp groups are moderated by subject matter experts, teachers, or experienced educators can benefit from their guidance, expertise, and insights on various academic topics, exam strategies, and study techniques.

Join the School of Educators WhatsApp Group today and unlock a world of resources, support, and collaboration to take your teaching to new heights. To join, simply click on the group links provided below or send a message to +91-95208-77777 expressing your interest.

**Together, let's empower ourselves & Our Students and
inspire the next generation of learners.**

**Best Regards,
Team
School of Educators**

Join School of Educators WhatsApp Groups

You will get Pre- Board Papers PDF, Word file, PPT, Lesson Plan, Worksheet, practical tips and Viva questions, reference books, smart content, curriculum, syllabus, marking scheme, toppers answer scripts, revised exam pattern, revised syllabus, Blue Print etc. here . Join Your Subject / Class WhatsApp Group.

Kindergarten to Class XII (For Teachers Only)



[Click Here to Join](#)

Class 1



[Click Here to Join](#)

Class 2



[Click Here to Join](#)

Class 3



[Click Here to Join](#)

Class 4



[Click Here to Join](#)

Class 5



[Click Here to Join](#)

Class 6



[Click Here to Join](#)

Class 7



[Click Here to Join](#)

Class 8



[Click Here to Join](#)

Class 9



[Click Here to Join](#)

Class 10



[Click Here to Join](#)

Class 11 (Science)



[Click Here to Join](#)

Class 11 (Humanities)



[Click Here to Join](#)

Class 11 (Commerce)



[Click Here to Join](#)

Class 12 (Science)



[Click Here to Join](#)

Class 12 (Humanities)



[Click Here to Join](#)

Class 12 (Commerce)



[Click Here to Join](#)

Kindergarten

Subject Wise Secondary and Senior Secondary Groups (IX & X For Teachers Only)

Secondary Groups (IX & X)



[Click Here to Join](#)

SST



[Click Here to Join](#)

Mathematics



[Click Here to Join](#)

Science



[Click Here to Join](#)

English



[Click Here to Join](#)

Hindi-A



[Click Here to Join](#)

IT Code-402



[Click Here to Join](#)

Hindi-B



[Click Here to Join](#)

Artificial Intelligence

Senior Secondary Groups (XI & XII For Teachers Only)



[Click Here to Join](#)

Physics



[Click Here to Join](#)

Chemistry



[Click Here to Join](#)

English



[Click Here to Join](#)

Mathematics



[Click Here to Join](#)

Biology



[Click Here to Join](#)

Accountancy



[Click Here to Join](#)

Economics



[Click Here to Join](#)

BST



[Click Here to Join](#)

History



[Click Here to Join](#)

Geography



[Click Here to Join](#)

Sociology



[Click Here to Join](#)

Hindi Elective



[Click Here to Join](#)

Hindi Core



[Click Here to Join](#)

Home Science



[Click Here to Join](#)

Sanskrit



[Click Here to Join](#)

Psychology



[Click Here to Join](#)

Political Science



[Click Here to Join](#)

Painting



[Click Here to Join](#)

Vocal Music



[Click Here to Join](#)

Comp. Science



[Click Here to Join](#)

IP



[Click Here to Join](#)

Physical Education



[Click Here to Join](#)

APP. Mathematics



[Click Here to Join](#)

Legal Studies



[Click Here to Join](#)

Entrepreneurship



[Click Here to Join](#)

French



[Click Here to Join](#)

IT



[Click Here to Join](#)

Artificial Intelligence

Other Important Groups (For Teachers & Principal's)



[Click Here to Join](#)

Principal's Group



[Click Here to Join](#)

Teachers Jobs



[Click Here to Join](#)

IIT/NEET

Join School of Educators WhatsApp Groups

You will get Pre- Board Papers PDF, Word file, PPT, Lesson Plan, Worksheet, practical tips and Viva questions, reference books, smart content, curriculum, syllabus, marking scheme, toppers answer scripts, revised exam pattern, revised syllabus, Blue Print etc. here . Join Your Subject / Class WhatsApp Group.

Kindergarten to Class XII (For Students Only)



[Click Here to Join](#)

Class 1



[Click Here to Join](#)

Class 2



[Click Here to Join](#)

Class 3



[Click Here to Join](#)

Class 4



[Click Here to Join](#)

Class 5



[Click Here to Join](#)

Class 6



[Click Here to Join](#)

Class 7



[Click Here to Join](#)

Class 8



[Click Here to Join](#)

Class 9



[Click Here to Join](#)

Class 10



[Click Here to Join](#)

Class 11 (Science)



[Click Here to Join](#)

Class 11 (Humanities)



[Click Here to Join](#)

Class 11 (Commerce)



[Click Here to Join](#)

Class 12 (Science)



[Click Here to Join](#)

Class 12 (Humanities)



[Click Here to Join](#)

Class 12 (Commerce)



[Click Here to Join](#)

**Artificial Intelligence
(VI TO VIII)**

Subject Wise Secondary and Senior Secondary Groups (IX & X For Students Only) Secondary Groups (IX & X)



[Click Here to Join](#)

SST



[Click Here to Join](#)

Mathematics



[Click Here to Join](#)

Science



[Click Here to Join](#)

English



[Click Here to Join](#)

Hindi



[Click Here to Join](#)

IT Code



[Click Here to Join](#)

Artificial Intelligence

Senior Secondary Groups (XI & XII For Students Only)



[Click Here to Join](#)

Physics



[Click Here to Join](#)

Chemistry



[Click Here to Join](#)

English



[Click Here to Join](#)

Mathematics



[Click Here to Join](#)

Biology



[Click Here to Join](#)

Accountancy



[Click Here to Join](#)

Economics



[Click Here to Join](#)

BST



[Click Here to Join](#)

History



[Click Here to Join](#)

Geography



[Click Here to Join](#)

Sociology



[Click Here to Join](#)

Hindi Elective



[Click Here to Join](#)

Hindi Core



[Click Here to Join](#)

Home Science



[Click Here to Join](#)

Sanskrit



[Click Here to Join](#)

Psychology



[Click Here to Join](#)

Political Science



[Click Here to Join](#)

Painting



[Click Here to Join](#)

Music



[Click Here to Join](#)

Comp. Science



[Click Here to Join](#)

IP



[Click Here to Join](#)

Physical Education



[Click Here to Join](#)

APP. Mathematics



[Click Here to Join](#)

Legal Studies



[Click Here to Join](#)

Entrepreneurship



[Click Here to Join](#)

French



[Click Here to Join](#)

IT



[Click Here to Join](#)

AI



[Click Here to Join](#)

IIT/NEET



[Click Here to Join](#)

CUET

Groups Rules & Regulations:

To maximize the benefits of these WhatsApp groups, follow these guidelines:

1. Share your valuable resources with the group.
2. Help your fellow educators by answering their queries.
3. Watch and engage with shared videos in the group.
4. Distribute WhatsApp group resources among your students.
5. Encourage your colleagues to join these groups.

Additional notes:

1. Avoid posting messages between 9 PM and 7 AM.
2. After sharing resources with students, consider deleting outdated data if necessary.
3. It's a NO Nuisance groups, single nuisance and you will be removed.
 - No introductions.
 - No greetings or wish messages.
 - No personal chats or messages.
 - No spam. Or voice calls
 - Share and seek learning resources only.

Please only share and request learning resources. For assistance, contact the helpline via WhatsApp: +91-95208-77777.

Join Premium WhatsApp Groups Ultimate Educational Resources!!

Join our premium groups and just Rs. 1000 and gain access to all our exclusive materials for the entire academic year. Whether you're a student in Class IX, X, XI, or XII, or a teacher for these grades, Artham Resources provides the ultimate tools to enhance learning. Pay now to delve into a world of premium educational content!

[Click here for more details](#)



Click Here to Join

Class 9



Click Here to Join

Class 10



Click Here to Join

Class 11



Click Here to Join

Class 12

📢 Don't Miss Out! Elevate your academic journey with top-notch study materials and secure your path to top scores! Revolutionize your study routine and reach your academic goals with our comprehensive resources. Join now and set yourself up for success! 🇧🇩🌟

Best Wishes,

Team

School of Educators & Artham Resources

SKILL MODULES BEING OFFERED IN MIDDLE SCHOOL



Artificial Intelligence



Beauty & Wellness



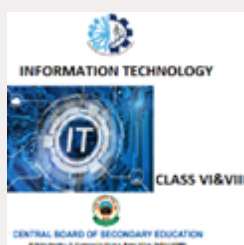
Design Thinking & Innovation



Financial Literacy



Handicrafts



Information Technology



Marketing/Commercial Application



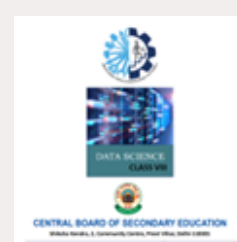
Mass Media - Being Media Literate



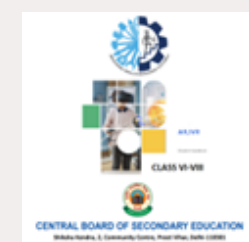
Travel & Tourism



Coding



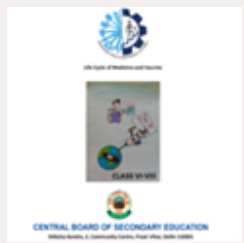
Data Science (Class VIII only)



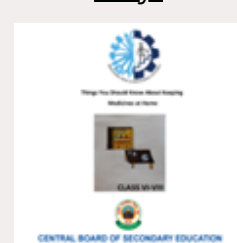
Augmented Reality / Virtual Reality



Digital Citizenship



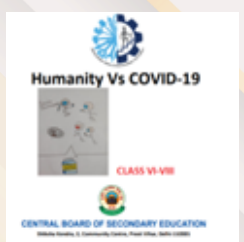
Life Cycle of Medicine & Vaccine



Things you should know about keeping Medicines at home



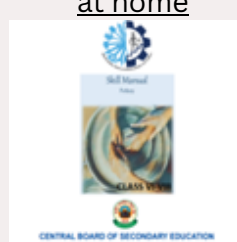
What to do when Doctor is not around



Humanity & Covid-19



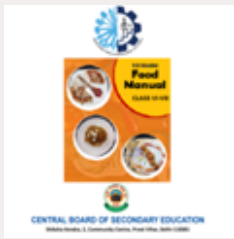
Blue Pottery



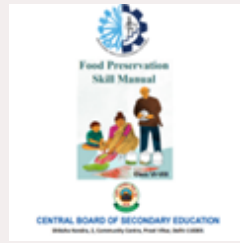
Pottery



Block Printing



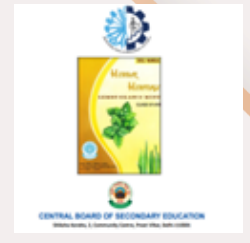
Food



Food Preservation



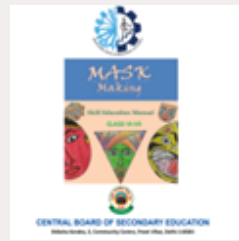
Baking



Herbal Heritage



Khadi



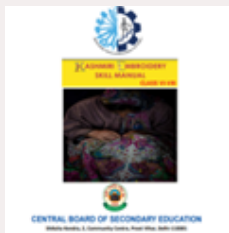
Mask Making



Mass Media



Making of a Graphic Novel



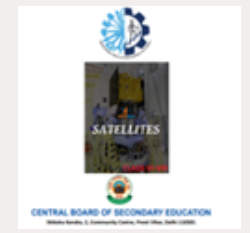
Kashmiri Embroidery



Embroidery



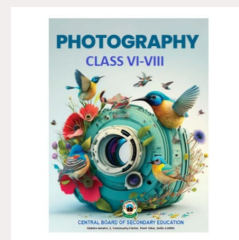
Rockets



Satellites



Application of Satellites

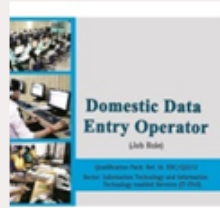


Photography

SKILL SUBJECTS AT SECONDARY LEVEL (CLASSES IX – X)



Retail



Information Technology



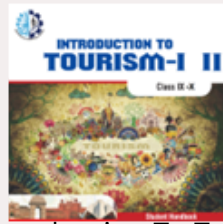
Security



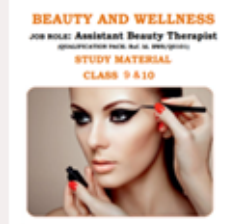
Automotive



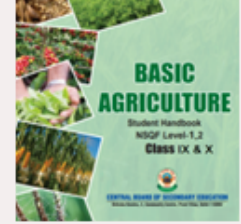
Introduction To Financial Markets



Introduction To Tourism



Beauty & Wellness



Agriculture



Food Production



Front Office Operations



Banking & Insurance



Marketing & Sales



Health Care



Apparel



Multi Media



Multi Skill Foundation Course



Artificial Intelligence



Physical Activity Trainer



Data Science



Electronics & Hardware (NEW)



Foundation Skills For Sciences (Pharmaceutical & Biotechnology)(NEW)



Design Thinking & Innovation (NEW)

SKILL SUBJECTS AT SR. SEC. LEVEL (CLASSES XI – XII)



Retail



Information Technology



Web Application



Automotive



Financial Markets Management



Tourism



Beauty & Wellness



Agriculture



Food Production



Front Office Operations



Banking



Marketing



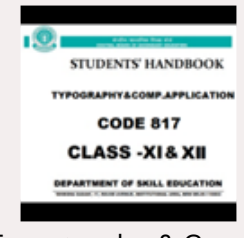
Health Care



Insurance



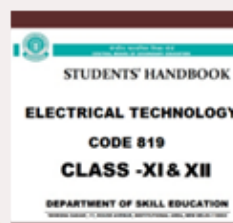
Horticulture



Typography & Comp.
Application



Geospatial Technology



Electrical Technology



Electronic Technology



Multi-Media



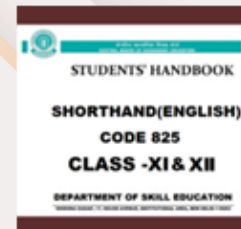
Taxation



Cost Accounting



Office Procedures & Practices



Shorthand (English)



Shorthand (Hindi)



Air-Conditioning & Refrigeration



Medical Diagnostics



Textile Design



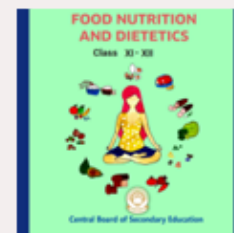
Design



Salesmanship



Business Administration



Food Nutrition & Dietetics



Mass Media Studies



Library & Information Science



Fashion Studies



Applied Mathematics



Yoga



Early Childhood Care & Education



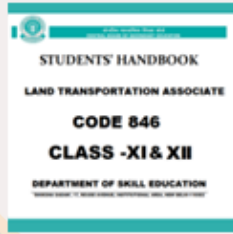
Artificial Intelligence



Data Science



Physical Activity Trainer(new)



Land Transportation Associate (NEW)



Electronics & Hardware (NEW)



Design Thinking & Innovation (NEW)